GAO

**Transition Series** 

December 1992

# Transportation Issues





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GAO

United States General Accounting Office Washington, D.C. 20548

Comptroller General of the United States

December 1992

The Speaker of the House of Representatives The Majority Leader of the Senate

In response to your request, this transition series report discusses major policy, management, and program issues facing the Congress and the new administration in the area of transportation. The issues include (1) investing wisely to rebuild and enhance surface transportation infrastructure, (2) modernizing air traffic control and enhancing airports, (3) improving transportation safety, (4) increasing airline competition and access to international markets, (5) strengthening Coast Guard acquisition programs and environmental protection, and (6) consolidating financial systems and revamping grant oversight.

As part of our high-risk series on program areas vulnerable to waste, fraud, abuse, and mismanagement, we are issuing a related report, Federal Transit Administration Grant Management (GAO/HR-93-16, Dec. 1992).

The GAO products upon which this transition series report is based are listed at the end of the report.

We are also sending copies of this report to the President-elect, the Republican leadership of the Congress, the appropriate congressional committees, and the Secretary-designate of Transportation.

Charles A. Bowsher

Charles A. Bowell

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### Transportation Issues

Rebuilding the nation's roads and bridges. managing the \$32 billion air traffic control modernization program, making travel safer, and ensuring a competitive airline industry are all major transportation issues facing the new Congress and incoming administration. Resolving these issues will critically affect the nation's economy: Transportation jobs provide 15 percent of U.S. employment and account for 18 percent of Americans' purchases, or about \$800 billion annually. Furthermore, investing in transportation will have a profound effect on the mobility of people, the quality of the environment, and the competitiveness of the nation in the international marketplace.

Since 1988, several significant developments have occurred that will shape the direction of this country's transportation programs far into the future. A central theme of our 1988 transition report on transportation issues was the need for a national transportation plan. In 1990, following extensive public hearings, former Secretary of Transportation Samuel K. Skinner issued the National Transportation Policy Strategy, which formed a cornerstone for transportation planning.

Building on this strategy, the Congress enacted the landmark Intermodal Surface Transportation Efficiency Act of 1991, which authorized an unprecedented \$155 billion over 6 years to implement an integrated, multimodal solution to the nation's transportation problems. Implementing the requirements of this legislation and obtaining the funding necessary to do so will be among the most formidable challenges facing the new Secretary.

Even though the act authorized record funding, the costs of meeting infrastructure needs are likely to far exceed available resources: The Department of Transportation (DOT) estimates that merely maintaining the condition of the nation's highways and bridges at 1989 levels would cost about \$250 million over the next 6 years; improving conditions would cost about \$425 billion. These estimates do not include funds needed for mass transit or rail systems.

This report discusses these and other major transportation challenges facing the Congress and the new administration.

Federal, state, and local governments are faced with rebuilding an aging infrastructure-highways and bridges—while simultaneously improving air quality, meeting mobility needs of people who are disabled, optimizing limited resources, reducing traffic congestion, and investing in new technologies to enhance existing transportation systems. Our reports have pointed to signs of the aging infrastructure—the ride on over 40 percent of the nation's interstate highway system is barely tolerable, and about 40 percent of the nation's bridges need repair and rehabilitation. Dot estimates that during the next 6 years nearly one-half trillion dollars will be needed to improve these conditions.

To guide and pay for these tasks, the Congress in 1991 enacted landmark surface transportation legislation. Because of the funding flexibility and intermodal concepts embodied in it, this legislation will alter the landscape for transportation decision-making throughout the 1990s. In doing so, it will give rise to a host of new challenges, including

 developing an organizational structure that facilitates investment trade-offs among

aviation, mass transit, highways, and rail;

- optimizing the use of funds because needs far outweigh available resources; and
- capitalizing on new technologies, such as high-speed rail and intelligent vehicle/highway systems.

#### Organizing DOT for Modal Trade-Offs

The 1991 legislation encourages using a total systems approach to select among transportation alternatives rather than focusing on only one form of transportation at a time to solve the problem at hand. However, DOT is organized into separate modal agencies, and this structure is not an optimum one to effectively implement the policy objectives of the new act.

To compensate for this shortcoming, the 1991 legislation created the Office of Intermodalism and the Bureau of Transportation Statistics. These offices will need to (1) help define the federal role in transportation problem-solving, (2) provide technical assistance to states and localities, and (3) develop and disseminate transportation data. Depending on the success these new offices have in fostering the intermodal approach and assisting states

and local governments as they decide on critical infrastructure investments, DOT may need to consider other organizational changes that coordinate the planning and financing arms of the separate modal administrations. One such change, suggested by the National Academy of Public Administration, would create a Surface Transportation Administration to encompass the missions currently performed by separate rail, highway, and transit agencies.

### Optimizing Investment of Available Funding

Although the new act's \$155 billion authorization over 6 years is unprecedented, infrastructure needs will continue to far exceed available resources. According to DOT estimates, the total federal, state, and local cost just to maintain highways and bridges over the 6-year period, without any improvements over 1989 levels, would be about \$250 billion. Moreover, the total cost to improve the condition of highways and bridges during the 6 years is nearly double that amount—\$425 billion. Neither of these estimates includes funds needed for mass transit and rail systems. Budgetary pressures and projected revenue shortfalls from fuel taxes compound the difficulties in meeting the enormous need for infrastructure improvements. For example, although about

\$26 billion was authorized for surface transportation programs in 1993, obligation limitations limited the amount available to about \$22 billion. Also, given current revenue estimates, even more reductions may be needed in the future because anticipated fuel tax revenues are projected to be nearly \$6 billion short of supporting the full highway authorization.

To get the greatest return from the funds available to them, state and local governments need additional help from DOT. As we noted in our April 1992 report on transportation planning, DOT could assist state and local governments by developing a common basis for evaluating projects in various transportation modes—highway, mass transit, rail line, or some combination. These projects compete on their ability to meet critical objectives such as protecting the environment, meeting travelers' mobility needs, conserving energy, and staying within budgetary limits. Our report said that methods for comparing such projects were not well developed at any level of government. A compelling need also exists for dot to develop methodologies for data collection and analysis that state and local analysts can use to compare projects. With better data and analytic tools to assess these

trade-offs, state and local governments will be in a better position to make well-informed choices among projects.

In addition, DOT will need to champion other efforts that will directly contribute to maximizing available funds. For example, ensuring that research is given appropriate priority and that its results are disseminated and promoted will foster state-of-the-art testing methods and better road materials. The Transportation Research Board estimates that reducing the cost of asphalt paving by 1 percent through research efforts would save as much as \$100 million per year. In addition, supporting innovative highway contracting practices could encourage greater use of new methods and materials, promote contractor accountability, and result in higher quality transportation projects.

Emerging Technologies Offering Opportunities New and emerging technologies, such as high-speed rail and intelligent vehicle/highway systems, could in some instances benefit the nation's overall transportation system by reducing pollution, energy usage, and congestion, and by making more efficient use of the transportation infrastructure. Although the benefits of

introducing these technologies have been discussed extensively, dot and the Congress must resolve important issues before these technologies can be successfully implemented.

For high-speed rail, two key issues require resolution. The first of these is how to finance high-speed rail development. Several alternative systems have been proposed, but none has obtained private funding to begin construction, and federal funding has been relatively small. Our work suggests that it is very unlikely that a development strategy relying primarily on private financing will be successful. As with all other transportation modes in their developmental stages, and regardless of which high-speed rail technology is adopted, a federal financial commitment will be necessary to leverage private financing.

The second key issue is ensuring that the full range of available technologies is considered. High-speed rail technologies include magnetic levitation trains (or maglev), which are relatively expensive but can attain speeds up to 300 miles per hour; advanced steel-wheel/steel-rail systems (speeds up to 200 miles per hour); and relatively inexpensive upgrading of existing

passenger-rail systems (speeds up to 150 miles per hour). The best technology for a particular route depends on such features as the length of the route and the level of traffic. For example, maglev may be best suited to (1) long-haul routes (up to 600 miles), where its higher speeds may compete with air travel and (2) high-traffic routes with sufficient volume to recover maglev's higher costs. Upgrading existing rail systems, on the other hand, may be the most cost-effective strategy on shorter routes.

Intelligent vehicle and highway systems are a family of technologies ranging from centralized traffic control centers to in-vehicle driver information systems to fully automated freeways that are designed to make more efficient use of the nation's roads. We reported in 1991 on the promise and problems of such technologies. The Congress enacted into law much of what we recommended, including a requirement that DOT develop a program of operational field tests in accordance with a strategic research plan. DOT needs to develop such a plan because it would be a necessary step toward enabling intelligent vehicle and highway systems to fulfill their promise.

## Modernizing Air Traffic Control and Enhancing Airports

The nation's air traffic control and airport systems must be upgraded to accommodate the growth in air travel that has occurred since the early 1980s and the forecasted future growth. In addition, maintenance of the existing aviation infrastructure is needed to stem deterioration. Reflecting these needs, federal capital investments in air traffic control and airports increased from \$600 million in 1982 to \$4.3 billion in 1992. To make the best use of these funds, the Federal Aviation Administration (FAA) needs to (1) address key issues related to air traffic control modernization and (2) strengthen its approach to airport development.

Key Issues for Air Traffic Control Modernization Our 1988 transition report noted that the costs of air traffic control modernization were much higher than FAA had projected and that schedule delays were common. These problems continue. FAA estimates that it will spend \$32 billion between 1982 and 2000 to modernize air traffic control—about \$7 billion more than it estimated 4 years ago. Of the more than 200 projects in FAA's modernization effort, only 36 are completed, accounting for just 3 percent of the \$32 billion. Ongoing major projects are well over budget and years behind schedule. Twelve major projects, which account for a

third of the cost of modernization, have an average schedule delay of 5 years. FAA acknowledges that these problems were not caused by a lack of funding.

The following key issues are critical to the success of FAA's modernization program: acquisition reform, facility consolidation, application of emerging technologies, and continuity of leadership.

- FAA has taken steps to strengthen its process for procuring costly and complex equipment (radars and computers) so that future cost overruns and schedule delays are minimized. A more stringent process for top management review and approval of new projects and operational testing is now in place. However, FAA still must resolve issues related to developing software and identifying users' requirements. Also, FAA continues to invest in equipment without adequately analyzing the agency's needs.
- FAA faces a critical decision in consolidating air traffic control facilities. This decision will have far-reaching implications for its modernization plan. A central underpinning of the plan is that the number of facilities will be reduced from over 200 to 23. We have raised concern about this assumption, and

FAA now acknowledges that at least another 30 facilities will be needed, each costing millions of dollars to rehabilitate and equip. Not consolidating facilities as planned could profoundly affect the modernization plan's centerpiece—the \$5 billion Advanced Automation System project for replacing controllers' work stations and computers, already 6 years behind and about \$2.5 billion over the initial 1983 schedule and cost projections. In November 1992, major development problems led the contractor to announce an additional schedule delay of 1 year. FAA subsequently directed the contractor to submit a plan for resolving the problems. Indecision about consolidation makes this project vulnerable to even further delays and cost increases because the number and size of the facilities are key variables in the design of the new computer systems.

 Advances in technology are causing FAA to reconsider elements of its modernization plan. For example, with satellite-guided advanced precision approaches to airports, the need for FAA to spend \$2.6 billion on 1,280 microwave landing systems that perform a similar function may be significantly reduced. Furthermore, with satellite-based navigation and surveillance, costly navigation aids and radars could be phased out.

• FAA leadership has changed frequently. Over the past 11 years, FAA has had eight different administrators and acting administrators. Strong, continuous attention from the highest levels of the agency is needed to follow through on FAA's acquisition reforms, which have been in effect only during the last 2 years. Also, past administrators have deferred resolution of difficult issues, such as facility consolidation, to their successors. Leadership stability is essential for FAA to deal effectively with these issues, carry out its revised plans, and adjust its plans as necessary.

Using Airport
Development
Funds to Achieve
National Goals

We have identified the need for FAA to strengthen its approach to airport development. FAA's national plan for airport development has no measurable goals, such as keeping total flight delays nationwide from rising. And many view FAA's plan as a "wish list" because it includes low-priority projects at small airports that FAA ultimately will never rank high enough to fund or that the sponsoring airport cannot afford, even with federal assistance.

On the basis of our work on major airport development projects at Denver, Detroit, and Chicago, we are concerned about FAA's process for allocating the limited funds available through the Airport Improvement Program. FAA has the opportunity to leverage the program's \$2 billion in federal grant funds by favoring projects that best achieve national goals, such as reducing flight delays and increasing airport capacity, while at the same time preserving environmental quality. However, to compare the ability of competing projects to achieve such goals. FAA needs better data and analytical methods. Over the next few years, we plan to evaluate the airport development program and suggest ways for FAA to better achieve the objectives set forth by the Congress.

### **Improving Transportation Safety**

Over the last several years, dot has focused on strengthening and rebuilding its work forces, including faa air traffic controllers and safety inspectors at the Federal Highway Administration, the Federal Railroad Administration, and faa. After some success, the key challenge now is to effectively deploy these resources to help reduce the many thousands of lives lost on highways and to increase the margin of safety in other transportation modes.

To meet this challenge, the Department must ensure that (1) each modal administration effectively follows through on safety initiatives begun in recent years and (2) resources are targeted to areas of highest safety risk. We have reported frequently on the strengths and weaknesses in DOT's regulation and enforcement of safety standards and recommended actions to reduce safety risks, including requiring air bags in light trucks and vans, encouraging states to pass laws for safety belt and motorcycle helmet use, and requiring improvements in hazardous material movements. Dot has responded favorably to many of our recommendations.

#### Follow-Through Needed

Notwithstanding DOT's positive actions to improve safety, additional management

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commitment is needed because follow-through by some individual agencies has been inconsistent or in some cases has stalled. Some agencies do not have current and reliable information to allow effective oversight of safety compliance. FAA does not have an effective system to monitor inspection findings and ensure that airlines take appropriate corrective actions. This monitoring is especially important for the approximately 1,400 aging aircraft—one-third of the fleet—subject to new regulations to ensure continued aircraft safety. Similarly, DOT's highway agencies lack data on heavy truck travel and accidents to determine safety trends and accident causes that would guide actions to improve safety.

#### Better Targeting of Resources Needed

In our 1987 comprehensive review of dot's management and in several reports since that time, we have recommended that dot develop early warning indicators of safety risks and measures of safety program performance to help target its limited resources. This would help agencies like faat that cannot reasonably be expected to have sufficient resources to conduct the thousands of inspections of aircraft, repair stations, and pilots that comprise its work

load. DOT has been slow, however, in implementing this recommendation.

For example, in response to our recommendation that FAA develop criteria for targeting aircraft inspections on the basis of risk analysis, the agency plans to evaluate a prototype targeting system in 1993; however, FAA does not plan to fully implement it for several years. We also have recommended that to better isolate and manage areas of greatest aviation risk, FAA should correct long-standing problems in its Safety Indicators Program, including unreliable data and limited user involvement in designing the data collection and analysis system. Finally, the Federal Railroad Administration only recently adopted measures that would overhaul its inspection and hazardous materials programs.

# Increasing Airline Competition and Access to International Markets

Dramatic changes in the U.S. airline industry threaten the benefits of lower air fares and more choices that consumers realized as a result of the industry's deregulation. Recent bankruptcies and mergers in combination with long standing barriers to entering the industry have reduced competition and led to a decline in the number of major U.S. airlines. With fewer firms comprising the industry and serving key airports, the competition that can promote low fares and better service may erode. The Congress and DOT need to take actions to solve the underlying problems that threaten domestic competition and to facilitate U.S. airlines' competitiveness in international markets.

Preserving Competition in Domestic Air Travel Markets We have reported on barriers that deter competition in the U.S. airline industry, including certain aspects of airline computer reservation systems, frequent flyer programs, travel agent/air carrier relationships, and the limited access to key airport facilities for potential new entrants. These deterrents can effectively lock out potential competitors, especially at airports where one or two airlines have established dominant positions.

To address these problems, we have reported on numerous occasions that DOT needs to address practices that affect competition, such as long-term, exclusive-use leases of gates, the allocation of takeoff and landing slots at key congested airports, and various features of computer reservation systems that are owned by the largest airlines.

In addition to overcoming practices that make market entry difficult, the U.S. airlines in the weakest financial condition need greater access to capital to enhance their ability to compete effectively. Poor earnings and high debt make it difficult for these airlines to finance capital needs from earnings or from traditional domestic sources. Although several foreign airlines are currently offering to provide investment capital, existing federal law limits the proportion of voting stock that foreigners can hold in U.S. airlines and the amount of influence that they can exert as a result of their investment.

Although relaxing the law would give financially struggling U.S. airlines greater access to needed capital, it could have implications for national security, domestic and international competition, and domestic employment. DOT may ask the Congress to consider relaxing restrictions on foreign investment. If restrictions are relaxed, the timing and extent of DOT's review process will need to be changed to ensure that foreign investments do not diminish the competitiveness of U.S. airlines or threaten national security.

### Facilitating Global Competitiveness

Tomorrow's aviation industry will be dominated by airlines whose routes span the globe, and such international markets offer U.S. airlines the greatest potential for growth. However, U.S. airlines may be constrained from entering international markets by agreements between the United States and other countries that limit the number of airlines that can be designated to serve specific routes. As these agreements are renegotiated, the Congress and DOT will need to respond to protectionist forces abroad that seek to restrict the ability of the nation's airlines to compete. Because of the United States' position as the world's most attractive air travel market, DOT could, if necessary, use foreign airlines' desire to serve the United States as leverage for gaining better access for U.S. airlines to overseas markets.

### Strengthening Coast Guard Acquisition Programs and Environmental Protection

In recent years, the Coast Guard has proposed numerous major acquisitions for planes, vessels, and on-shore facilities. At the same time, the Coast Guard's mission has broadened considerably to include, for example, a key role in environmental protection. Ensuring that the Coast Guard adequately manages its major acquisition programs and effectively implements recently enacted oil spill legislation will be a major challenge.

#### Attention to Coast Guard Acquisitions Needed

Our work has shown that the Coast Guard's acquisition process has systemic problems. In one case, these problems led to the cancellation of a major acquisition: The Coast Guard canceled its \$329 million purchase of Heritage class patrol boats after we reported in July 1991 that the project was not adequately justified. Although the Coast Guard is implementing procurement reforms, the adequacy of its justifications for and management of future major acquisitions will be a continuing concern.

### Environmental Protection a Shared Responsibility

Our work on oil pollution has shown a continuing need for the Coast Guard to improve its oversight of the industry's efforts to prevent environmentally dangerous

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Strengthening Coast Guard Acquisition Programs and Environmental Protection

accidents. The 1989 Exxon Valdez oil spill helped produce legislative and regulatory changes to protect the environment.

Although government and industry will share the cost of these changes, many concerns are still outstanding. Among these concerns are whether (1) insurance to cover all costs related to cleaning up an oil spill will be available for shippers, (2) the industry can comply with new requirements for providing equipment to respond to a spill and for improving oil tanker design, and (3) the Coast Guard will be able to effectively monitor the industry's compliance with the many new regulations.

## Consolidating Financial Management Systems and Revamping Grant Oversight

DOT needs to continue improving its financial management systems and oversight mechanisms for reducing the risk of fraud, waste, and abuse. In response to our recent reports on DOT's financial management and on the Federal Transit Administration's (FTA) grant oversight, DOT has stated its commitment to take substantive actions on our recommendations.

#### Better Information Needed to Control Programs

por has embarked on a project to consolidate 14 separate accounting systems into a single Departmental Accounting and Financial Information System. To date, estimates of this project's costs exceed \$26 million. We found that while por has made progress in developing a consolidated accounting system, action is now needed to provide managers and the Congress with better financial information to oversee programs and operations.

The new consolidated system is currently of limited value as a managerial tool because it does not maintain detailed financial information from prior years on long-term projects. It also cannot generate timely spending reports for project management. We have recommended that, to realize the full potential of its financial management

Consolidating Financial Management Systems and Revamping Grant Oversight

system, the Department develop a plan containing clear objectives, resource estimates, and timetables for strengthening the system's value as a management tool.

#### Plan to Revamp Grant Oversight

In a series of reports issued since June 1991, we documented FTA's laissez-faire approach to overseeing transit grants, grantees' deficient internal controls, and the resulting mismanagement of hundreds of millions of federal grant dollars. In response to these and similar concerns raised by DOT's Office of Inspector General, FTA's Administrator approved a plan to revamp grant oversight, including fully implementing most of our recommendations. Although efforts to improve oversight are under way, FTA will have to be persistent to ensure that implementation of the new initiatives does not lose momentum. Besides the \$35 billion in active grants that are currently at risk of mismanagement, the 1991 surface transportation legislation substantially increases authorized annual transit funding from \$3.2 billion to \$5 billion and allows the use of up to \$70 billion in highway funds for transit needs over the next 6 years.

The current focus on expanding federal investment in infrastructure, including mass

Consolidating Financial Management Systems and Revamping Grant Oversight

transit, increases the need for wise allocation and careful oversight of federal funds. Until recently, FTA focused its resources on awarding grants rather than on ensuring their proper use. Successful implementation of FTA's plan to change its focus ultimately will depend on the support that the administration and the Congress give to the agency's efforts to exercise strong oversight of grant funds. If fully implemented, the new oversight strategy should better safeguard future transit funds from the risk of fraud, waste, and abuse.

### **Related GAO Products**

#### Surface Transportation Infrastructure

Highway Trust Fund: Strategies for Safeguarding Highway Financing (GAO/RCED-92-245, Sept. 9, 1992).

Transportation Infrastructure: Urban
Transportation Planning Can Better Address
Modal Trade-offs (GAO/RCED-92-112, Apr. 2,
1992).

High Speed Ground Transport: Acquiring Rights-of-way for Maglev Systems Requires a Flexible Approach (GAO/RCED-92-82, Feb. 2, 1992).

### Airway and Airport Systems

Airspace Systems: Emerging Technology May Offer Alternatives to the Instrument Landing System (GAO/RCED-93-33, Nov. 13, 1992).

Air Traffic Control: Advanced Automation

System Still Vulnerable to Cost and Schedule

Problems (GAO/RCED-92-264, Sept. 18, 1992).

Air Traffic Control: Challenges Facing FAA's Modernization Program (GAO/T-RCED-92-39, Mar. 10, 1992).

Airport Development: Improvement Needed in Federal Planning (GAO/T-RCED-92-30, Feb. 19, 1992).

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#### Improving Transportation Safety

Highway Safety: Safety Belt Use Laws Save Lives and Reduce Costs to Society (GAO/RCED-92-106, May 15, 1992).

Truck Safety: The Safety of Longer Combination Vehicles Is Unknown (GAO/RCED-92-66, Mar. 3, 1992).

Aviation Safety: Problems Persist in FAA's Inspection Program (GAO/RCED-92-14, Nov. 11, 1991).

Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3, Apr. 13, 1987).

# Increasing Airline Competition

Airline Competition: Impact of Changing Foreign Investment and Control Limits on U.S. Airlines (GAO/RCED-93-7, Dec. 9, 1992).

Computer Reservation Systems: Action Needed to Better Monitor the CRS Industry and Eliminate CRS Biases (GAO/RCED-92-130, Mar. 20, 1992).

Airline Competition: Industry Competitive and Financial Problems (GAO/T-RCED-92-28, Feb. 21, 1992).

### Coast Guard Programs

Coast Guard: Oil Spills Continue Despite Waterfront Facility Inspection Program (GAO/T-RCED-92-12, Oct. 24, 1991).

Coast Guard: Adequacy of the Justification for Heritage Patrol Boats (GAO/RCED-91-188, July 12, 1991).

### Financial Management and Grant Oversight

Mass Transit Grants: If Properly Implemented, FTA Initiatives Should Improve Oversight (GAO/RCED-93-8, Nov. 19, 1992).

Financial Management: DOT'S Accounting and Financial Information System Can Be Improved (GAO/RCED-92-238, Sept. 22, 1992).

#### General

Transportation Issues (GAO/OCG-89-25TR, Nov. 1988).

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